

SCO M2: Demonstrate an understanding of the imperial system by: describing the relationships of the units for length, area, volume, capacity, mass and temperature, [C, CN, ME, V]

ACHIEVEMENT INDICATORS

- Explain how the imperial system was developed.
- Identify commonly used units in the imperial system, and determine the relationships among the related units.
 - Identify contexts that involve the imperial system.
- Explain, using examples, how and why fractions are used in the imperial system.
- Write a given measurement expressed in one imperial unit in another imperial unit.

The Imperial System

The Imperial System was developed over hundreds of years in the UK, then the French developed the Metric System in 1670, which soon spread through Europe. However, the USA and a few other countries still prefer feet and inches.

Examples of Imperial measures:

Length: inches, feet, yards

Area: square feet, acres

Weight: pounds, ounces

Volume: fluid ounces, gallons, pints, quarts

- In the imperial system, the base unit for measuring length is the foot and the base unit for measuring volume is the pint.

Imperial Relationships

12 inches (in. or ") = 1 foot (ft. or ')

3 feet = 1 yard (yd.)

1760 yards = 1 mile (mi.)

5280 feet = 1 mile

Mental Math Question

In 1995, while playing for the Mount Allison Mounties, Eric Lapointe ran the ball for 311 yards. How many feet is that?

$$1 \text{ yd} = 3 \text{ feet} = 36''$$

$$1 \text{ yd} = 3 \text{ feet}$$

$$1 \text{ yd} = 36''$$

$$3 \text{ feet} = 36''$$

Imperial Conversions

- In order to solve an imperial measurement problem, you may have to convert the given measurements into common units. To convert from one imperial unit to another imperial unit, use a conversion factor.

- A conversion factor is a fraction with the numerator containing the units to which you want to convert. The denominator contains the original units in which the measurement was taken.

$$1 \text{ foot} = 12 \text{ inches}$$

$$\frac{1 \text{ foot}}{12 \text{ in.}} \text{ or } \frac{12 \text{ in}}{1 \text{ foot}}$$

Example: How many inches is 6.5 feet (6.5')?

Solution: We know that there is 12 inches in 1 foot. So...

$$6.5' \times \frac{12''}{1'} = 78''$$

$$6.5' \times \frac{12''}{1'} = 78'' \quad \text{There are 78 inches in 6.5 feet.}$$

Wednesday, April 25

*If you did not write your test on Thursday or pass in your assignment you need to come see me asap. I will be in my room at lunch hour today! (I will not be here during lunch hour on Thursday or Friday).

Today:

- Check answers to the assigned practice questions
- Begin Lesson 3 (Imperial/Metric conversions)
- Practice questions

Imperial Conversion Exercise

1) 16 in. = _____ ft.

$$16 \cancel{\text{in.}} \times \frac{1}{12 \cancel{\text{in.}}} = 1.3 \text{ ft.}$$

2) 2 mi. = _____ yd.

$$2 \text{ mi.} \times \frac{1760 \text{ yd.}}{1 \cancel{\text{mi.}}} = 3520 \text{ yd.}$$

3) 4 ft. = 48 in.

$$4 \text{ ft.} \times \frac{12 \text{ in.}}{1 \text{ ft.}} = 48 \text{ inches}$$

4) 2.5 ft. = 30 in.

$$2.5 \text{ ft.} \times \frac{12 \text{ in.}}{1 \text{ ft.}} = 30 \text{ in.}$$

5) 1200 yd. = _____ mi.

$$1200 \text{ yd.} \times \frac{1 \text{ mi.}}{1760 \text{ yd.}} = 0.68 \text{ mi.}$$

6) 56 in. = _____ ft.

$$56 \text{ in.} \times \frac{1 \text{ ft.}}{12 \text{ in.}} = 4.6 \text{ ft.}$$

7) 7 yd. = 21 ft.

$$7 \text{ yd.} \times \frac{3 \text{ ft.}}{1 \text{ yd.}} = 21 \text{ ft.}$$

8) 3520 yd. = _____ mi.

9) 24 ft. = _____ yd.

10) 1760 yd. = _____ in.

Example #2:

You have decided to build a small hockey rink in your backyard. You are using plywood that is 4' x 8' to make rink boards. The rink will be shaped like a rectangle that is 50' by 30'. How many sheets of plywood will you need?

Solution

$$P = 50' + 50' + 30' + 30' = 160'$$

$$\frac{160'}{8'} = 20$$

You will need 20 sheets of plywood.

(use larger plywood dimension)

Tuesday, May 1

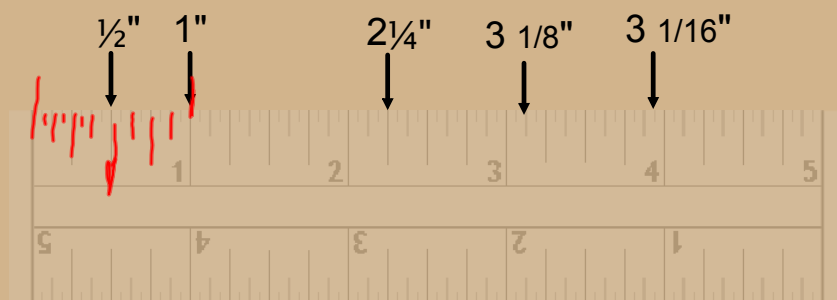
*In-class Assignment from last Thursday/Friday is due this Wednesday! Extra help available at lunch hour.

Today:

- Correct Fractions and Imperial Conversions
- Finish other Extra Practice worksheets
- Temperature Conversions

Fractions and the Imperial System

The numbers written (1,2,3,etc.) on a imperial ruler represent the inches. Each inch is divided up into 16 smaller parts. The halves and quarters of an inch are represented with lines that are a little longer.



$$\frac{2}{16} = \frac{1}{8}$$

On the sheet provided, you have 3 imperial rulers. For each ruler, place the appropriate measures.

Handout #5 Fractions and the Imperial System.docx

Ruler #1: Place the following:

A. $3\frac{1}{4}"$

B. $\frac{3}{4}"$

C. 4"

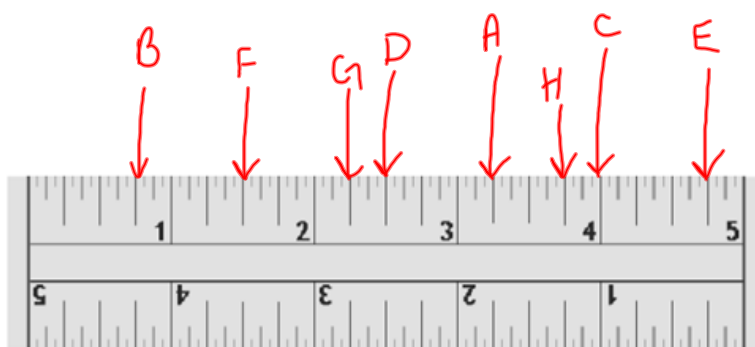
D. $2\frac{1}{2}"$

E. $4\frac{3}{4}"$

F. $1\frac{1}{2}"$

G. $2\frac{1}{4}"$

H. $3\frac{3}{4}"$



Ruler #2: Find the sixteenth measures

A. $\frac{2}{16}$ "

B. $2\frac{12}{16}$ "

C. $3\frac{7}{16}$ "

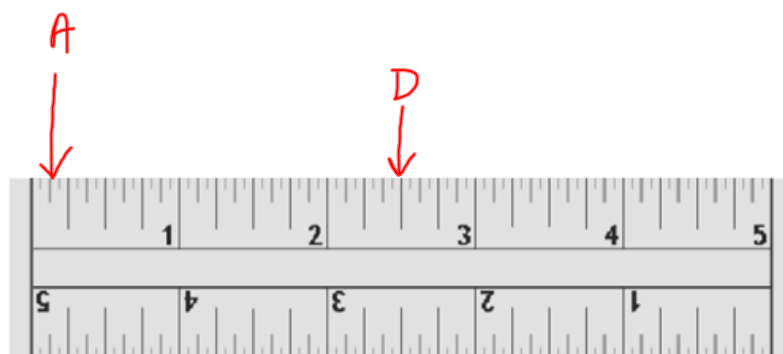
D. $2\frac{8}{16}$ "

E. $1\frac{9}{16}$ "

F. $\frac{10}{16}$ "

G. $4\frac{14}{16}$ "

H. $4\frac{5}{16}$ "



Ruler #3: Find the eighth measures

A. $\frac{1}{8}$ "

B. $3\frac{6}{8}$ "

C. $3\frac{3}{8}$ "

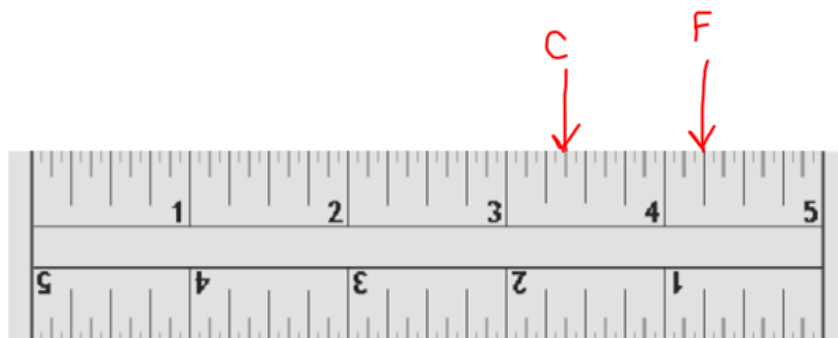
D. $\frac{4}{8}$ "

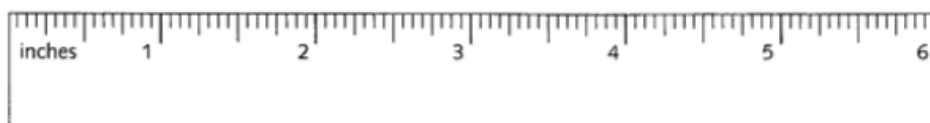
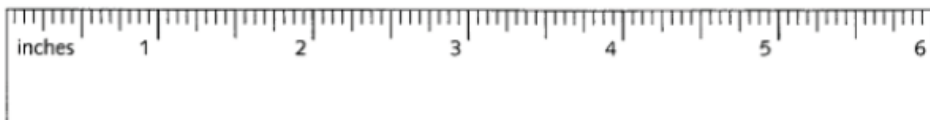
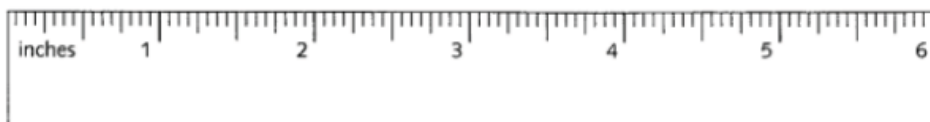
E. $2\frac{5}{8}$ "

F. $4\frac{2}{8}$ "

G. $4\frac{7}{8}$ "

H. $1\frac{7}{8}$ "





Converting between inches, feet, yards, and miles

Imperial Conversion Table

1 foot = 12 inches

1 yard = 3 feet = 36 inches

1 mile = 1760 yards = 5280 feet

Examples:

1. $4 \text{ ft } 4 \text{ in} = \underline{52 \text{ in}}$
 $\begin{array}{r} \times 12 \\ 48 \\ \hline \end{array}$
 $= 48 \text{ in}$

2. $2 \text{ mi } 8 \text{ in} = \underline{10560 \text{ ft } 8 \text{ in}}$
 $\begin{array}{r} \times 5280 \\ 10560 \\ \hline \end{array}$

3. $132 \text{ in } 3 \text{ yd} = \underline{20 \text{ ft}}$
 $\begin{array}{r} \div 12 \\ 11 \\ \hline \end{array}$
 $= 11 \text{ ft}$
 $\begin{array}{r} \times 3 \\ 9 \\ \hline \end{array}$
 $= 9 \text{ ft}$

4. $2 \text{ mi } 4 \text{ yd} = \underline{10572 \text{ ft}}$
 $\begin{array}{r} \times 5280 \\ 10560 \\ \hline \end{array}$
 $+ 12 \text{ ft}$
 $= 10572 \text{ ft}$

Converting between inches, feet, yards, and miles

Convert each measure to inches.

1. 3 ft = 36 in

2. 7 in 8 yd = 295 in

3. 8 yd = 288 in

4. 8 yd 1 in = 289 in

5. 2 ft = 24 in

6. 5 in 2 ft = 29 in

7. 5 yd = 180 in

8. (3 ft) 2 in = 38 in

Convert each measure to feet.

9. 2 ft 8 yd = 26 ft

10. 3 mi = 15840 ft

11. 108 in 8 yd = 33 ft $\div 12 = 9$ ft

12. 4 yd = 12 ft

13. 1 mi 10 yd = 5310 ft $\times 3 = 24$ ft

14. 9 yd = 27 ft

Convert each measure to feet and inches

15. 39 in 3 yd = 12 ft 3 in

17. 13 in 1 yd = 4 ft 1 in

19. 3 mi 102 in = 15848 ft 6 in

16. 102 in = 8 ft 6 in

18. 87 in = 7 ft 3 in

20. 85 in = 7 ft 1 in

→ 3 ft 3 in
9 ft

(19) 3 mi →
3 × 5280 = 15840 ft
102 in → ÷ 12 = 8.5 ft

Attachments

Handout #5 Fractions and the Imperial System.docx